

REMARKS

Claims 1-20 are pending. By this Amendment, independent claims 1, 14 and 15 are amended. No new matter is added.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

In the Office Action, claims 1-4 and 7-15 are rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,489,900 to Cali. Additionally, claims 5-6 are rejected under 35 U.S.C. §103(a) over Cali. Finally, claims 16-20 are rejected under 35 U.S.C. §103(a) over Cali in view of Applicants admitted prior art. These rejections are respectfully traversed.

Independent claims 1, 14 and 15 are amended to clarify the invention. The invention is directed to a pointing device comprising: a sensor substrate having a flat board form (such as strain detecting section 3 in Figure 1); a stick member vertically provided on an upper surface of the sensor substrate (such as stick member 2 provided on an upper surface of substrate 3); at least a pair of strain sensors arranged in symmetrical relation to each other with respect to the stick member (such as strain sensors 8a-8d); and a slit formed on the sensor substrate near the strain sensor (such as slits 3b shown in Figure 1). The slit remains on the sensor substrate and induces an increase in the amount of deformation generated in the sensor substrate during operation of the stick member.

Cali fails to teach, disclose or suggest such features which are found in each of independent claims 1, 14 and 15.

Cali discloses a pointing device mountable on a computer keyboard that is basically constructed of a flexible plastic sheet 110 having a rectangular portion 112 and a base 132 provided thereon with a column 130 having a rectangular cross section. A rectangular portion 112 is formed with patterns 102-108 of strained sensitive material that are orthogonally arranged. This rectangular portion 112 is then sliced in an x-shaped pattern 128

so that each of the patterns 102-108 is on a separate triangular tab. Column 130 disposed on the base 132 serves as a sensor. See Figures 1 and 4.

To assemble the Cali device, flexible plastic sheet 110 is placed on top of column 130 and forced downward with a tool 144 (see Figure 2). This causes the triangular tabs to flex upwardly to form aperture 146 and glide along the sides of column 130. When the flexible sheet 110 reaches base 132, sheet 110 is held against base 132 by an adhesive 148. The triangular tabs 102-108 are also held against the sides of column 130 by the adhesive. As a result, the strain sensitive patterns 102-108 are arranged on different sides of the column, respectively, so that the bending strain caused in the column 130 can be sensed. This structure is substantially different from that being claimed.

In making the rejections, the Office Action asserts that the flexible plastic sheet 110 corresponds to the claimed "sensor substrate." The Office Action also alleges that column 130 corresponds to the recited stick member and sensitive patterns 102-108 correspond to the claimed strained sensors. However, in making the rejection, the Office Action also asserts that the x-shaped pattern 128 corresponds to the recited "slit." However, as clearly evidenced by Figures 2-4 of Cali, the x-shaped pattern 128 is formed to allow the column 130 to be inserted from above. After insertion of the column, the tabs are fixedly adhered onto the sides of column 130. In other words, the x-shaped pattern 128 constituting the slit is not present in the final formed configuration. Instead, there is now a resultant rectangular opening formed corresponding in size to the column 130. With this structure, it is completely impossible for pattern 128 to induce "an increase in an amount of deformation generated in the sensor substrate during operation of the stick member." On the contrary, the L-shaped slits 3b in Applicant's exemplary embodiment remain and allow increased deformation of the substrate during operation of the stick member.

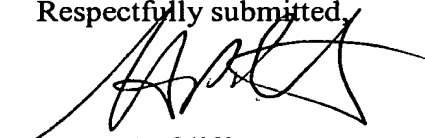
Moreover, even if x-shaped pattern 128 was a slit at one time, the slit does not remain on the sensor substrate during operation of the stick member (i.e., when sensing strain using the pointing device). Furthermore, column 130 is not even vertically provided on an upper surface of the sensor substrate as also recited in the independent claims.

Accordingly, because Cali does not teach each and every feature of the independent claims, these claims are not anticipated by Cali. Moreover, because Cali does not appreciate problems overcome by the claimed invention, such modifications to Cali would not have been obvious to one of ordinary skill in the art. For example, by providing the claimed "slits" and retaining them during use, it is possible to effectively deform or warp the portions of the sensor substrate 1 where the strain sensors 8a-8d are present. See Applicants' specification at, for example, page 10, lines 3-8. On the contrary, because tabs 102-108 forming the sensors are fixably adhered to column 130, there is no remaining structure in Cali that could structurally correspond to the recited slit or achieve the specified function of increasing the amount of deformation generated in the sensor substrate during operation of the stick member. The admitted prior art of Figures 13-15 fail to overcome the deficiencies of Cali with respect to independent claims 1, 14 and 15. Accordingly, independent claims 1, 14 and 15 are believed to define over the applied references. Moreover, dependent claims 2-13 and 16-20 are deemed allowable for their dependence on allowable base claims, and for the additional features recited therein. Withdrawal of the outstanding rejections is respectfully requested.

In view of the foregoing amendments and remarks, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-20 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number set forth below.

Respectfully submitted,



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APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claims:

1. (Amended) A pointing device including:
 - a sensor substrate having a flat board form;
 - a stick member vertically provided on an upper surface of the sensor substrate;
 - at least a pair of strain sensors arranged in symmetrical relation to each other with respect to the stick member; and
 - a slit formed on the sensor substrate near the strain sensor, the slit remaining on the sensor substrate and inducing an increase in an amount of deformation generated in the sensor substrate during operation of the stick member.
14. (Amended) A keyboard provided with a plurality of keys arranged on a keyboard substrate and a pointing device mounted on a part of an operating face of the keyboard, the pointing device including:
 - a sensor substrate having a flat board form;
 - a stick member vertically provided on an upper surface of the sensor substrate;
 - at least a pair of strain sensors arranged in symmetrical relation to each other with respect to the stick member; and
 - a slit formed on the sensor substrate near the strain sensor, the slit remaining on the sensor substrate and inducing an increase in an amount of deformation generated in the sensor substrate during operation of the stick member.

15. (Amended) An electronic device provided with a keyboard including: a plurality of keys arranged on a keyboard substrate and a pointing device mounted on a part of an operating face of the keyboard; a controller for controlling various data input with the keys on the keyboard; and a display for displaying the data under control by the controller;

wherein the pointing device includes:

a sensor substrate having a flat board form;

a stick member vertically provided on an upper surface of the sensor substrate;

at least a pair of strain sensors arranged in symmetrical relation to each other with respect to the stick member; and

a slit formed on the sensor substrate near the strain sensor, the slit remaining on the sensor substrate and inducing an increase in an amount of deformation generated in the sensor substrate during operation of the stick member.